WHAT IS CLAIMED IS:

1.   A method of analyzing a distribution, comprising steps of:

   (a)   collecting data from a data source;

   (b)   constructing a histogram based on the data such that the histogram defines a distribution; and

   (c)   fitting tail regions of the distribution wherein deterministic and random components of the distribution are estimated.

2.   The method of claim 1, wherein the fitting step comprises the steps of:

   (a)   finding a first and a second tail region of the distribution;

   (b)   fitting the first and second tail region to a predefined first model and second model, respectively; and

   (c)   estimating fitted parameters of the first model and the second model.

3.   The method of claim 2, further comprising the step of checking the fitting of the first and second tail region.

4.   The method of claim 2, further comprising the step of calculating the statistical confidence of the fitted parameters.

5.   The method of claim 1, further comprising the step of displaying the deterministic and random components of the distribution.

6.   The method of claim 2, wherein the finding step comprises the step of finding the fist and second tail region based on a first derivative and second derivative method.

7.   The method of claim 2, wherein the first model and second model are Gaussian models.

8.   The method of claim 2, wherein the first model and second model are multiple Gaussian models.   .

9.   The method of claim 2, wherein the model parameters comprise μ and σ.

10.   The method of claim 9, wherein the deterministic component is calculated according the following formula: $\mu 1 - \mu 2$.

11.   The method of claim 10, wherein the random component is calculated according the following formula $(\sigma 1 + \sigma 2)/2$.

12.   The method of claim 1, wherein the distribution comprises a signal distribution.

13.   The method of claim 12, wherein the signal distribution is a jitter signal distribution.

14.   An apparatus for analyzing a distribution, the apparatus comprising:

(a)   a measurement apparatus for collecting data; and

(b)   an analyzing unit, operatively connected to the measurement apparatus, for collecting data from the measurement apparatus, constructing a histogram based on the data such that the histogram defines a distribution, fitting tail regions of the distribution, wherein deterministic and random components of the distribution are estimated.

15.   The apparatus of claim 14, wherein the analyzing unit further comprises:

(a)   means for finding a first and a second tail region of the distribution;

(b)   means for fitting the first and second tail region to a predefined first model and second model; and

(c)   means for determining fitted parameters of the first model and the second model.

16.   An article of manufacture comprising a program storage medium readable by a computer having a memory, the medium tangibly embodying one or more programs of instructions executable by the computer to perform method steps for performing operations analyzing a distribution, the method comprising the steps of:

(a)   collecting data from a data source;

(b)   constructing a histogram based on the data such that the histogram defines a distribution; and

(c)   fitting tail regions of the distribution wherein deterministic and random components of the distribution are estimated.

17.   The article of manufacture of claim 16, wherein the fitting step further comprises the steps of:

(a)   finding a first and a second tail region of the distribution;

(b)   fitting the first and second tail region to a predefined first model and second model; and

(c)   determining the fitted parameters of the first model and the second model.